

Editorial Summary.

BET SUGAR IN GERMANY.—A German agricultural journal gives an interesting account of the beet sugar business in that country. Fields of beets of from two to three hundred acres are often seen there. The beets are drilled in rows about fifteen inches apart and the whole labor of cultivation performed by the hoe. The women and men work in gangs of twenty or more. The men get from sixteen to nineteen cents per day and the women from thirteen to fifteen—working fourteen hours. The manufactories for this sugar are on a correspondingly large scale, some of them employing a thousand hands. The beets are brought from the field and elevated to the upper story of a high building, where they are cleaned, crushed, and filtered, the juice descending from story to story, undergoing a refining process by the way till it reaches the lower one in the shape of a sugar cone two and a half feet in length. It is a very nice article and worth at the factory about ten cents per pound. It takes eight days from the time of crushing the beets till the sugar is dried sufficiently for market. One of these establishments turned out six millions of pounds last year with the help of six hundred hands.

THUNDERBOLTS AS REMEDIES.—An English writer argues that several physical maladies can be cured by lightning. The doctrine that "like cures like," holds good, he asserts, in the case of maladies to which the destructive element gives birth; whether the fright, or some proper action of the electric fluid works the cure, it is hard to say, but the fact is incontestible. Several cases are reported where individuals paralyzed from their youth have recovered complete use of their limbs by lightning strokes in after years. A country clergyman in Kent was paralyzed by apoplexy in 1761, and struck by lightning about a year after, when all traces of the paralysis left him. A man who had lost the use of both arms was guarding some animals in a field; lightning fell upon him, and when he came to his senses he found that he could use both arms and hands. These are but a few out of many recorded instances. A variety of ailments besides paralysis have been cured or ameliorated by the same agency, even blindness; for one Gardley, some time an actor at the Surrey Theater, who had been for many years blind of one eye, had his sight quite restored by a lightning flash.

POWER OF A GROWING TREE.—Walton Hall, England, had at one time its own corn mill, and when that inconvenient necessity no longer existed, the mill stone was laid by in an orchard and forgotten. The diameter of this circular stone measured five feet and a half while its depth averaged seven inches throughout; its center hole had a diameter of eleven inches. By mere accident some bird squirrel had dropped the fruit of the filbert tree through the hole on the earth; and in 1812 the seedling was seen rising up through that unwonted channel. As its trunk gradually grew through this aperture and increased, its power to raise the ponderous mass of stone was speculated upon by many. Would the filbert tree die in the attempt? Would it burst the mill-stone? or would it lift it? In the end the little filbert tree lifted the mill-stone, and in 1863 wore it like a crinoline about its trunk; and Mr. Waterton used to sit upon it under the branching shade.

PRESERVATION OF BUILDING STONE.—An Illinois architect has invented a process for preserving from decay and disfigurement the beautifully colored stone called "Athens marble," which is now used very extensively at the West for building fronts. This stone is composed principally of carbonate of lime, carbonate of magnesia, and silica, but among the minor ingredients, protoxide of iron pervades the whole mass, giving the characteristic blue-greenish tint, the main cause of its beauty, but the cause also of its decay, as exposure to the atmosphere converts the protoxide into hydrated sesquioxide of iron, or iron rust. To remedy this action the stone is coated with a soluble glass, made by melting a mixture of fifteen parts of silica, ten of soda, and one of charcoal, until it forms a glass which is reduced to the liquid form by boiling in water. This solution permanently fastens itself to the surface and protects the stone from the atmosphere, smoke, and dust.

PHYSIOLOGICAL ACTION OF ALCOHOL.—The same observer has propounded a physiological law relative to alcoholic fluids, which is to the effect that the period of time required by these bodies to produce their effects, and the period of time required for recovery, turned altogether on the boiling point of the fluid used. This is so certain that the boiling point and action of one fluid being known, the action of any other fluids might be predicted from their boiling point. The explanation is simply that the alcohols taken into the body are not changed in their chemical composition, and their evolution and time of evolution are the mere matter of the expenditure of force, caloric, to raise them and carry them off. The practical lesson to be drawn is, that in case of alcoholic poisoning of the human subject, the most important condition for recovery is a high temperature.

EXTRACTING INDIGO FROM RAGS.—A French patent has been allowed for a new method of recovering indigo from cotton or woolen rags which have previously been dyed with that substance. The inventor places the rags in a boiler provided with a double bottom and saturates them thoroughly with a solution of caustic soda of 1° Baume. After this the rags are kept for five hours under the action of steam at 45 pounds pressure. By this treatment the indigo is reduced, and dissolved, then precipitated from the soda solution, and finally collected in as pure state as the best sorts in commerce.

DEATH BY FIRE DAMP.—Dr. B. W. Richardson, F. R. S., in investigating the physiological action of the methyl compounds, has particularly observed the action of the hydride of methyl, which occurs naturally in the form of fire-damp in mines, and as marsh gas on land. Seeking first to ascertain what percentage would prove fatal in the air, he found that even pigeons could live in an air charged with thirty-five per cent of the gas, for half an hour. When death finally ensued, it came as a sleep, so gentle that it was determined with difficulty when either circulation or respiration ceased. From these observations he concluded that the victims of a mine explosion die an easy but prolonged death, and while the knowledge of the first of these truths should inspire thankfulness, the latter should encourage the rescuing party not to abandon their exertions even for days after the accident has occurred.

THE RAMIE PLANT.—We have received from Mr. A. B. Bacon, chairman of the Section of Agriculture, New Orleans Academy of Science, a specimen of fiber made from this plant, which is beautifully white and fine, and certainly very strong. The accompanying circular asserts that the plant may be started with root cuttings, and will flourish in any climate where the ground does not freeze over a foot deep, and never needs replanting. Well rooted plants will produce from two to five cuttings of the stalk in a year, each giving 150 pounds of fiber to the acre. A native of Java, the plant has been domesticated in Mexico by D. Benito Roehl, a Belgo-Austrian botanist, who has also invented a machine for cleaning it. Any further information may be obtained from Mr. Bacon, at the *Picayune* Office, N. O.

MOCK SUNS.—The inhabitants of Lee county, Va. were lately much excited over the rather uncommon spectacle of apparently three suns rising at the same time. The central orb was encircled by a beautiful iris, surmounted by the fragment of another one, which extended on either hand above the attendant suns. After a brief space, these latter dissolved, leaving the only original Sol in the enjoyment of his full glory. The phenomenon, while it lasted, was a subject of dismay and affright to the ignorant populace, who considered it as certainly portentous of coming evil.

A NUMBER of illustrations of excellent inventions, intended for this issue, are necessarily left out to make room for our Spanish correspondent's letter, and other interesting matter, which could not be deferred.

How Muskrats Swim Under the Ice.

Muskrats have a curious method of traveling long distances under the ice. In their Winter excursions to their feeding grounds, which are frequently at great distances from their abodes, they take in breath at starting, and remain under the water as long as they can. They then rise up to the ice, and breathe out the air in their lungs, which remains in bubbles against the lower surface of the ice. They wait till this air recovers oxygen from the water and ice, and then take it in again, and go on till the operation has to be repeated. In this way they can travel almost any distance, and live any length of time under the ice. The hunter sometimes takes advantage of this habit of the muskrat in the following manner:—When the marshes and ponds, where the muskrats abound are first frozen over, and the ice is thin and clear, on striking into their houses with his hatchet, for the purpose of setting his traps, he frequently sees a whole family plunge into the water and swim away under the ice. Following one of them for some distance, he sees him come up to renew his breath in the manner above described. After the animal has breathed against the ice, and before he has time to take his bubble in again, the hunter strikes with his hatchet directly over him, and drives him away from his breath. In this case he drowns in swimming a few rods, and the hunter, cutting a hole in the ice, takes him out. Mink, otter, and beaver travel under the ice in the same way, and hunters have frequently told me of taking otter in the manner I have described when these animals visit the houses of the muskrat for prey.—*Trapper's Guide.*

MANUFACTURING, MINING, AND RAILROAD ITEMS.

The largest pumps ever made in the United States have just been completed for the San Francisco Dry Dock Company. The casings of the pumps are ten feet in diameter. The weight of the material in each pump is 75 tons. They are calculated to raise 504,000 cubic feet, or 16,150 tons of water, and free the dock in two hours.

Something entirely new in the manufacture of porcelain has been introduced in a Philadelphia factory. The new material is called "hot-cast porcelain," for while containing the ingredients of which porcelain is composed, it is worked like glass, and like the latter it can be blown, pressed, or rolled into any desired shape.

The experiment of laying steel rails on different sections of the New York and New Haven railroad, has been so satisfactory that the whole line is to be relaid with them, and as a beginning, an order has been sent to a firm in England for two thousand tons. Several new passenger coaches, of the English pattern, are now building in Springfield for this line, and will be put upon the road during the present month. Each carriage will have five apartments, separately accommodating seven passengers, and the method lately introduced for heating cars by circulating hot water in pipes, will be adopted on these coaches. It is not a little singular that while we are introducing these apartment carriages, some of the English roads are, or contemplate doing the same with our long American cars.

Philadelphia modestly claims to have the largest military goods manufactory, the largest chemical factories, the largest book-selling house, and the most extensive locomotive works and machine shops in the United States. In the year 1866 her factories produced over \$200,000,000 of staple goods. Philadelphia is now the commercial center of 260 cotton and woolen factories, and has besides several thousand hand looms, of which the yearly product, it is asserted, is equal to that of seventy additional mills of average size.

It is stated that arrangements have been made for a projected railroad from St. Paul, Minn., to the western extremity of Lake Superior, distant one hundred and fifty miles in a nearly direct line. Seventy-five miles will be completed this year, and the whole by the end of 1869.

The Panama Railroad, during the twelve years of its existence, has transported only 396,032 passengers, but the treasure carried during that period exceeded \$500,000,000 in gold, \$147,000,000 in silver, \$19,000,000 in currency, and \$5,000,000 worth of jewelry. The tonnage of general merchandise exceeded 600,000,000, but it appears that the increase in outlay which this heavy traffic required, for wharves, rails and locomotives, has caused a falling off for the past year in the proportion of net receipts, as compared with previous years.

The *Moscow Gazette* publishes a telegram from M. Bogdanywitch, a prospector now making a journey of exploration in Siberia, to look into the expediency of building a railway in that immense province. The adventurer is very favorably impressed, and asserts that information he has gathered shows by facts the brilliant future reserved for the Siberian railway. It is now announced that on the commencement of spring, operations will begin upon the first division of the great Russia-China-Taschkent Railway.

SHIP LEAKING INDICATOR.—Shaler's patent bilge water indicator, with Brevoort's improvement, was recommended by the commission appointed a few months ago to investigate the appliances for saving life at sea. It is very simple in construction, and operates on the same principle and by nearly the same means as an ordinary steam-gage. A dial plate, over a box resembling a steam-gage, shows an index pointer which is operated by the compression of the air in a tube. From the valve inside the case one or more pipes, either flexible or rigid, descend to the bottom of the vessel and terminate in a lead or iron pipe of larger diameter, the bottom of which reaches nearly to the skin of the ship. The rise of water compresses the air in the tubes, and, by means of the valve inside the case and simple connecting mechanism, operates the index, thus denoting by figures on the dial the depth of the water in feet, inches, and their fractions. An independent pointer outside the glass of the dial serves to denote the relative increase or diminution of the water in pumping. One single instrument, located in the binnacle or pilot house, will, by means of branch pipes, denote the state of the water in two or more portions of the ship.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

SNOW PLOW.—Chas. Lusted, New York city.—This invention relates to a new plow for cleaning railroad tracks from snow, and consists in the use of an oscillating plowshare, which throws off the snow that has been raised by it, so as to prevent the accumulation of the snow upon the share. The oscillating share is hinged to a stationary lower share, and is connected with a crank on the axle or the truck, to which the device is secured. By means of a clutch arrangement the connection between the axle and the share may be established or interrupted at will, so that the upper hinged share may remain stationary if desired.

SCRAPER ATTACHMENT TO CARS.—E. B. Wells, Northampton, Mass.—The object of this invention is to provide railroad cars with a device for keeping the track clear of snow, mud, and other obstructions. The device is chiefly applicable to street or horse-cars and consists in the use of scrapers or plows, one in front of each wheel, which are suspended from powerful springs, that are attached to the underside of the car platform, which are operated by levers arranged at each end of the car.

CULTIVATOR.—Edwin Doolittle, Pawnee, Ill.—This invention has for its object to furnish an improved cultivator, simple in construction, effective in operation, and which may be easily and conveniently guided when at work.

KNITTING MACHINE.—John Chantrell, Bristol, Conn.—This invention relates to a new knitting machine in which a flat web can be knit by the aid of two sets of hooked needles, and by suitable sinkers playing up and down between the horizontal needles. The yarn is taken from one single spool, and is, by a suitable carrier, laid over the bodies of the horizontal needles, and is then between the needles depressed by the sinkers, the loops thus formed are cast off over the ends of the vertical needles upon loops held between the vertical and horizontal needles, and are thus locked. The invention consists chiefly in the peculiar manner of forming the loops by the two sets of needles and by the sinkers, and in the construction and arrangement of the devices by which the yarn guide, the needle carriers, the pressers, and sinkers, are set in motion in the required order and succession.

WATCH.—Geo. A. Bowen, Trenton, N. J.—This invention relates to a new device for protecting the drum in which the mainspring is contained and also the adjoining gear wheels and pinions from being injured by the breaking of the mainspring.

COMBINED FODDER CUTTER AND CORN SHELLER.—C. R. Hewett, Waupun, Wis.—This invention has for its object to furnish a machine by means of which corn may be shelled or fodder cut, as may be desired with equal facility.

BROOM OR BRUSH HOLDER.—Anthony G. Davis, Watertown, Conn.—This invention has for its object to furnish a neat, cheap, simple, convenient and effective device for holding a broom or brush suspended when not in use.

PLOW.—James Urle, Evansville, Ind.—This invention has for its object to furnish an improved plow simple in construction, effective in operation, which can be manufactured at small expense, and any part of which can be easily renewed when worn without its being necessary to send the entire plow to the manufactory to have the renewed part fitted.

HAY CUTTER.—J. F. Hammond, North Sudbury, Mass.—This invention has for its object to furnish an improved hay cutter which shall be self-feeding and double-acting, and which will do its work quicker and better than the hay cutters now in general use.

MARKER FOR SEWING MACHINES.—Joseph P. White, Savannah, Ga.—This invention consists chiefly in a new manner of attaching an adjustable cloth presser to an adjustable gage, so that the same can be set more or less to the front as may be desired, and so that the presser can be raised and lowered at pleasure. The invention also consists in a new manner of constructing a hemmer and of attaching the same so that it can be moved to form the gage, as may be desired.

FEED GUIDE FOR PRINTING PRESSES.—C. Potter, Jr., Westerly, R. I.—This invention relates to an adjustable feed guide for printing presses, and has for its object the facilitating of the adjustment of the guide, one screw only being manipulated in order to admit of the guide being adjusted in two different directions which are required.

CYLINDER PRINTING PRESS.—C. Potter, Jr., Westerly, R. I.—This invention consists in hanging or arranging the cylinder of that kind of printing presses known as the "drum cylinder," in such a manner that the cylinder may be raised, at the will of the operator, so as to be inoperative or incapable of giving any impression. The object of the invention is to give the operator or attendant entire control over the pressure cylinder, so that, in case of a sheet of paper being improperly set or presented to the cylinder, or the failure of a sheet being presented to it at all, the pressure cylinder, by being raised, will obviate many difficulties attending the above-mentioned contingencies.

PAD CRIMP OR PRESS.—George Kennedy, Clarksville, Iowa.—This invention has for its object to furnish an improved instrument by means of which the back pads of harness may be easily and accurately formed, so that the pad may be stitched with as much readiness as a piece of plain leather.

MACHINE FOR SAWING LATHES.—Emery T. Wheeler and Wm. H. Vaughan, Cannelton, Ind.—This invention relates to a new and improved machine for sawing lath, pickets, and strips for wheel spokes, chain stuff, etc., directly from the circumference of the log, without waste.

HANDLEVER SEWING MACHINE FOR PATCHING BOOTS, ETC.—David Forest, Eastport, Me.—The nature of this invention consists in a device for sewing patches on boots and shoes, and other similar articles, by means of a hand lever to work the needle.

TIRE SHRINKING MACHINE.—James Elliott, Milford, Wis.—This invention relates to a device for tire shrinking, and consists of a platform and bed piece, the latter supporting two sliding carriages carrying a notched or toothed flange, against which the tire to be shrunk is set, and held in place by two notched or ratchet cam levers, mounted on the same carriages, which are pressed together by one or two other cam levers, hung on vertical axes on the bed piece, thus shrinking the tire.

LOW WATER ALARM.—F. S. Davenport, Jerseyville, Ill.—This invention relates to a new and improved device for ascertaining the height of water in a steam boiler, and it consists in operating a valve by a float, whereby an alarm is given when the water in the boiler falls below the required quantity.

MIXING STEEL AND IRON.—James Cartwright, Youngstown, Ohio.—This invention relates to a new and improved method for combining steel and iron, whereby a greatly improved article is produced, as regards its tenacity, flexibility and strength.

HAY FORK.—Joseph H. Walker, Grand Rapids, Mich.—This invention relates to a new and useful arrangement, whereby the labor of handling hay is greatly lessened, and it consists in a fork of peculiar construction, which is attached to an irregular shaped frame, and so arranged that the position of the fork can be varied.

GRAIN MEASURING APPARATUS.—E. O. Melvin, Brooklyn, Wis.—In this invention the main feature is a lubricated shute provided with a gate which alternately closes one or the other branch of the shute, and which is connected with a registering apparatus that records the number of times the gate has been opened and closed.

SHINGLE MACHINE.—David L. Peacock, Rockport, Ind.—In this invention the shingle is split from a block, and planed while passing through the machine.

PRESERVE JAR.—F. J. Shefferly, Detroit, Mich.—This invention relates to a new and improved method of manufacturing jars for preserving fruits and other articles of diet of a similar nature, and it consists in the novel and improved method of sealing or securing the cover of the jar to the neck.

BOLT CUTTER.—E. A. Sloat, Theresa, N. Y.—This invention has reference to a new and improved method of cutting off the ends of bolts and rivets, an operation which has hitherto been performed by means of a cold chisel and hammer, and the invention consists in the arrangement of two cutters, the edges of which are operated in regard to each other like shears, but upon one of which cutters a compound lever purchase is obtained.

SPRING BED BOTTOM.—Gottlieb Koenig, Plymouth, Mich.—This invention relates to a new and improved method of constructing the bottom of spring beds, and the invention consists in an arrangement of bars and springs within the bottom, whereby the action on the springs serves to expand them instead of compressing them, thus preserving their elasticity and usefulness for a long period.

HAY KNIFE.—Charles A. Fisher, Geneseo, Ill.—This invention relates to a new and improved method of constructing or shaping knives for cutting hay, whereby the same are rendered more convenient in handling and more effective in operation than hay knives have hitherto been.

HORSE POWER HAY FORK.—Charles E. Gladding, Troy, Pa.—This invention consists in attaching to the handle and to the bait of the fork a jointed connection, formed of different parts or sections, which in the different positions the fork assumes as it is used in elevating and discharging the hay, places it entirely under the control of the operator, and greatly increases the value and usefulness of the invention.

SPRING BED BOTTOM.—S. J. Wingate, Decatur, Ill.—This invention has for its object to furnish an improved spring bed bottom, simple in construction, not liable to get out of order, and which may be readily attached to and removed from the bedstead.

CULTIVATOR.—C. A. Harper, Wheeling, Ind.—This invention has for its object to furnish an improved cultivator, so constructed and arranged as to remove the clods and rubbish in front of the plow, so that they may not be thrown against or upon the small plants being cultivated, and which will enable the plow to be much more easily raised to pass over stumps and other obstructions, and to be more easily transported from place to place.

LOCKING CAR SEATS.—Geo. R. Bayley and Jno. McCluskey, Algiers, La.—This invention relates to an improvement in locking and unlocking the reversible seat backs of railroad passenger cars, whereby all the seat backs on one side of the car can be locked or unlocked simultaneously.

DOOR HINGES.—Charles Dupré, Louisville, Ky.—This invention relates to an improvement in door hinges, and consists in a metal plate countersunk in the door, coinciding at the top of the door with a similar plate in the rabbet of the door frame, each furnished with projecting arms or ears connected by a pin; at the bottom of the door is a similar eared plate. A screw passing through the ear into a socket completes the hinge and renders the door adjustable in place.

TIRE SHRINKER.—Edward B. Decker, Bedford, Ill.—This invention has for its object to furnish an improved machine for shrinking tires, which shall be simple in construction, convenient to be used, and powerful in operation.

JOURNAL BOX.—Geo. H. Henfield, San Francisco, Cal.—This invention relates to improvements in the construction of bearings for railroad car axles or other journals, and consists in forming a brass or other metal attachment in connection with a cast iron box or shell, in such manner as to hold securely in place sections of Babbit or other soft metal for the bearings.

THREE-HORSE CLEVIS.—E. M. Potter, Kalamazoo, Mich.—This invention consists of a clevis provided with two grooved pulleys cast together and of unequal diameters; the chain from the doubletree winding on the smaller pulley, and that of the singletree winding upon the larger one, by which means a compensatory action is set up which enables three horses to be worked abreast in plowing or other equivalent work.

UTERINE ELECTRODE AND ABDOMINAL SUPPORTER.—A. J. Steele, New York city.—This invention relates to the application of electricity to the uterus and vagina when the latter are in different pathological conditions. It consists of insulated wires bent in suitable shapes and covered with a sponge or other equivalent substance for providing a medium of conduction from the insulated wire to the diseased part.

ICE SLEIGH.—John Rancevan, Carthage, N. Y.—This invention has for its object to furnish an improved ice sleigh, so constructed and arranged as to be propelled rapidly and conveniently over the ice by those riding in said sleigh.

TINMAN'S FORMING MACHINE.—Wm. Stine, Elmore, Ohio.—This invention relates to an improvement in a tinman's forming machine, and consists in a gage attached thereto for flaring cylinders or tubes at the end.

BAG FASTENER.—Daniel Overholzer, Polo, Ill.—This invention relates to an improved device for fastening the mouth of a bag of grain or other commodity, and consists in an iron hook pivoted to a link, and so arranged in connection with another link through which it passes that by moving in one pivot the bag is fastened with accord attached to both links, and by moving in the opposite direction the bag is unfastened.

ENDLESS CHAIN REVERSIBLE POWER FOR DRAWING CARS, ETC.—W. McCreery, Pittsburgh, Pa.—The object of this invention is to move cars or other heavy objects in and out of a depot or storehouse where steam power is located, by attaching a reversible gear to be connected when required with the thing to be moved.

MACHINE FOR BRAIDING WHIP LASHES.—Phineas L. Slayton, New York city.—This invention relates to an improved machine for braiding whip lashes, of any required number of strands, and it consists in a stationary hollow sphere open at top and bottom and supported between top and bottom plates by standards, which hollow sphere is cut up into segmental pieces or sections with channels or open passages between them to serve as guides for a series of fingers that are moved around to lay the strands by their own independent axes on opposite sides of the internal sphere, in pairs at angles to each other.

BUCKWHEAT HULLING MACHINE.—Joseph Baysore, Freeport, Ill.—This invention relates to improvements in a machine for hulling buckwheat or other grain.

BORING AND FITTING THE FELLIES AND SPOKES OF A WHEEL.—Albert Brush, East Constable, N. Y.—This invention relates to an improved mode of boring the fellies of a wheel.

SPOOLS OR BOBBINS.—A. P. Holmes, Great Falls, N. H.—This invention consists in loading or weighting a wooden spool or bobbin such as is used in cotton and woolen mills, by applying a metallic sheathing to the cylinder, or an equivalent thereof.

FLOURING MILL.—Wm. Craig, Uniontown, Pa.—The object of this improvement, in the construction of flouring mills is to dispense with the heavy, complicated, and expensive machinery in general use in small country mills, and provide a complete mill with two run of stones for both merchant and custom work, the machinery of which shall be simple and direct in its operation.

GRAIN THRASHING MACHINE.—John F. Skinner, Brasher Iron works, N. Y.—This invention relates to a new and improved means for operating or giving motion to the shoe which contains the grain screen; to an improvement in the construction of the grain and straw carrier; to an improved arrangement of a belt with a pulley and spring arranged in such a manner as to render a single belt efficient in driving the straw and grain carrier face and beater cylinder; and to the employment or use of friction rollers in connection with the peculiarly constructed grain and straw carrier, said parts being all so constructed and arranged as to possess important advantages.

HORSE RAKE AND TEDDER.—Frederick E. Nearing, Brookfield, Conn.—This invention relates to a combination of a horse rake and tedder, and it consists of a peculiar construction and arrangement of parts, whereby the device may, by a very simple manipulation, be readily converted from a rake into a tedder, and vice versa, and rendered capable of operating in either capacity equally as well as if made especially for either purpose.

BUCKLE.—Louis Elsberg, New York city.—The principal objects of this invention are, first, to unite the two loops of the buckle, the one for the attached strap, and the other for the buckling strap in such a manner that traction on them in opposite directions draws the bar of the tongue and the buckling loop into closer contact, and thereby holds the buckling strap the more firmly.

CULTIVATOR.—Joseph Widman, Panola, Ill.—This invention relates to a cultivator of that class designed more especially for cultivating corn and other crops, which are grown in hills or drills. The invention consists in a peculiar construction of the machine, whereby it may be readily converted from a riding or sulky cultivator into a walking cultivator, or one without a driver's seat, and a very simple and efficient cultivator obtained.

EXTENSION AND CLAMP CLOTHES POST.—George Dittenhaven, Napoleon, Ohio.—This invention relates to an improvement in clothes posts, and consists in a post working in a groove, and of a clamp for securing the line.

CORN PLOW.—S. H. Cox, and W. H. Pence, Mattoon, Ill.—This invention has for its object to improve the construction of corn plows or cultivators so as to make them more simple and durable in construction, and more convenient and effective in operation.

CULTIVATOR.—John W. Doud, Forestville, Iowa.—This invention has for its object to furnish a simple, substantial, durable, and cheap cultivator for putting in all kinds of grain sown broadcast, and for preparing the ground for winter wheat, which shall be so constructed as to economize time, labor, and seed, in putting in the grain, the machine destroying the weeds, and covering the grain uniformly, so that it can all come up.

WINDOW BLIND AND NETTING.—John R. Wharry, Moundsville, West Va.—This invention relates to a new and useful improvement in the construction of window blinds, and in the construction, attachment, and arrangement of netting frames to the window casing, whereby the movable slats of blinds are more neatly connected, and more conveniently operated, and whereby the netting frames are more convenient, and more effectually prevent the intrusion of insects.

FRUIT JAR.—J. M. W. Kitchen, New York city.—The present invention more particularly relates to that class of fruit jars provided with a screw thread for receiving the top or cover.

RAILROAD SWITCH.—W. L. Rogers, North Cornwall, and W. E. Crane, New Britain, Conn.—This invention relates to a railroad switch of that class which are commonly termed self-acting, and which are operated by the cars. The invention consists in a peculiar mechanism employed to serve as a stop to prevent the casual movement of the switch, and in a mechanism employed for moving the switch.

GATE.—G. P. Stebbins, Sparta Centre, Mich.—This invention relates to a gate of that class in which certain appliances are used to admit of them being opened or closed under the weight of the vehicle which passes through them, and which are commonly termed self-acting. The invention consists in the peculiar means employed for operating or opening and closing the gate.

ATTACHMENT FOR PLOW.—William Bennett, Rushville, Ind.—This invention relates to an attachment for corn or cultivator plows, for the purpose of preventing the mold board or share from casting clods of earth upon the plants during the process of plowing the same.

SAW.—George Walker, Middletown, N. Y.—This invention relates to an improvement in saws, both reciprocating and circular, whereby fixed teeth are made to possess all the advantages of the insertable teeth which are now coming into general use, and with far less expense, both as regards the first cost of the manufacture of the saw and the expense of keeping the same in perfect working order.

ENVELOPE.—F. Marion Shields, Macon, Miss.—The present invention consists in so forming an envelope that after having once been used it is susceptible of again being used by properly folding it therefor.

WHIP.—J. S. Cook, West Groton, Mass.—The present invention consists of an attachment to a whip stick for receiving and holding the lash portion of the whip, whereby the lash can freely turn upon the whip stick without winding around the stick as is now the case with the lash when secured to the whip stick by a string or strap.

STRAW OR HAY CUTTER.—A. J. Bell, Bloomingburg, N. Y.—The present invention relates to that class of hay or straw cutters the cutting blade of which is carried by a frame arranged to have an up and down motion in a vertical plane.

AUTOMATIC WATER GATE.—H. Besse, Delaware, Ohio.—This invention relates to a gate provided with certain devices which shall accomplish its opening and closing by the water of the stream which it spans.

DISH LIFTER.—D. E. Roe, Elmira, N. Y.—This invention is for the purpose of lifting hot plates or dishes from the top or oven of stoves. It consists of two wire claws affixed to a short wooden handle, one claw being made stationary and the other to yield against the tension of a spring.

SHINGLE MACHINE.—H. Woodman, Saco, Me.—This invention relates to a machine for sawing and planing shingles, and it consists of a rotary feed table, circular saw, and rotary planer, all arranged and combined to perform the desired work in a satisfactory manner.

HAY ELEVATOR.—Harvey McCown and Luther M. McCown, Little Beaver, Pa.—This invention relates to a device for elevating hay from wagons and depositing it in bays or mows, in bars or upon a stack. The object of the invention is to obtain a device for the purpose specified which will admit of the hay not only being elevated with facility but also being conveyed, after it reaches its highest point, over the spot where the hay is to be discharged.

WATER WHEEL.—George W. Wheeler and George V. Allen, Hartford, Vt.—This invention relates to an improvement in that class of water wheels which are keyed on a vertical shaft and work horizontally within a suitable case. The invention consists in a peculiar construction of the wheel and arrangement of the buckets, whereby a large percentage of the power of the water is obtained.

Business and Personal.

The charge for insertion under this head is one dollar a line.

Camden Tool and Tube Works Co., Camden, N. J., Manufacturers of Tube and the most improved Tools for Steam and Gas Fitters and Tube Manufacturers.

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W. R. Norris, Swanton Junction, Vt., wants the best Brick Machine, and Machines for jointing and crozing flat barrel staves.

Parties who are now, or have been, selling our machines in this State will please send their address to us. Shaw & Clark Sewing Machine Co., 1301 Broadway, New York.

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All carriage manufacturers in the Middle and Western States please send address to John R. Linton, New Bedford, Mass.

Parties having Rubber Machinery for sale please send particulars to H. A. Brown, Waltham, Mass.

An excellent business for male or female, requiring no capital. Address, with stamp, Cook & Wilson, Kirkville, N. Y.

Answers to Correspondents.

CORRESPONDENTS who expect to receive an answer to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondents by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 50 cents a line, under the head of "Business and Personal."

All reference to back numbers should be by volume and page.

H. A. M., asks "if the electric current produced by a Faraday magneto-electric machine will excite magnetism in a common electro-magnet formed of coils of wire around a horse shoe of iron." The common machines of this class give to and fro currents; that means the currents go (for every revolution of the coil) alternately in opposite directions and therefore produce only shocks, but neutralize the magnetic and chemical effects which electric currents moving in one direction only may produce; if, however, the magneto-electric machine is furnished with a so-called commutator, which is a contrivance reversing one current, and thus bringing them all in the same direction, it will magnetize a horseshoe, provided the wire in the coil producing the currents is not much thinner than that around the horseshoe. This principle has lately been applied in producing startling results in electrical science.

A. W., of Ind.—"How is the power of the wind estimated on a wind mill; by the actual weight of the air or the momentum? For instance, the wind is moving at the rate of 16 feet per second and strikes a surface of one foot square; would the mechanical effect be one lb. or 16 lbs.?" It would be neither. Wind moving at 22 feet per second exerts a force in pounds per square foot of 1.107.

J. S., of Miss.—If you wish to prepare your copal varnish so that it will be colorless, a little extra trouble will accomplish your object. Upon each piece of copal, drop a little rosemary oil, and select only such pieces as become soft on contact with the oil. These pieces are ground and passed through a fine sieve so as to be reduced to powder, which must then be placed in a glass and a corresponding volume of rosemary oil poured over it. After stirring the mixture it is transformed into a thick liquor, and after standing two hours a few drops of rectified alcohol is added and intimately mixed. Repeat the operation until the varnish is of the right consistency; finally decant the clear liquid. This varnish is adaptive to either wood or metals.

P. S., of Mass.—In the multitude of counsellors there may be wisdom, but when we receive in two weeks six communications on the "heptagon in a circle," five on "tides and their causes," eleven on the "solution of planet triangles," and thirteen on the "day line," we may be excused if we do not see the propriety of absorbing the room necessary to publish each one. We are grateful to our correspondents for their promptness in responding to suggestions made through our columns. We are always glad to receive them, but if their articles are not always published it should be attributed to the limits of our columns and not to boorish discourtesy.

A. J. H., of Mass., wishes to know how to galvanize cast iron. He treats his iron with acids to obtain a clean surface, and then plunges it in melted zinc, but is unsuccessful. There is some difficulty in galvanizing cast iron because of its irregularity of surface. Where the work is intended to be perfect and permanent, a deposit of pure iron by means of the battery is first given the casting. We presume that an ordinary coating may be obtained by simple immersion in the melted metal, which, however, should not be zinc only, but be composed of 202 parts by weight of mercury to 129 of zinc.

S. B., of N. Y., finds difficulty in tempering dies for a power hammer and asks how to make them stand. The dies should be of the best steel, and instead of being heated in an open fire should be packed in a cast-iron box with ground bones and heated gradually to a red, plunged into cold water, and drawn to a deep red inclining to blue. "Ede on Steel" is the best treatise we know of on hardening and tempering. It can be obtained at Appleton's, 445 Broadway, New York city.

S. W., of Conn., is making a lot of hollow steel punches, the hollow extending from the end up about seven eighths of an inch. He finds nine out of ten crack in hardening. Of course they will. The remedy is to drill a pin hole transversely across the body of the punch to meet the top of the hollow. This allows the steam to escape, and will entirely prevent the cracking while it will not materially weaken the punch. Indeed, all similar articles should be so treated before being hardened.

M. F. W., of Pa., cannot make a large pulley hold on the shaft. The key, although of steel and seated in a key-way or slot, "cuts into silvers" and allows the pulley to turn on the shaft. Our advice is to discard the key altogether, bore and tap one, two, or three holes through the hub, fit steel cup-ended screws, and no more trouble need be apprehended. These screws have a recess drilled at the end and the outside turned down on a bevel to the edge of the hole, making a circular edge. Then harden the end and insert the screw.

J. G. P., of N. Y.—The eccentrics of marine engines are secured to the shaft by three keys hollowed on the shaft side to fit the roundness of the shaft. They pass through key-ways in the hub, and are held to the shaft by set screws passing through the hub and bearing upon the top of the keys. The keys are driven home and the screws set down on them. It is an easy matter to move eccentrics thus secured.

A. M. G., of Ark.—Raw hide is one of the most tenacious substances known. It is extensively used for pickers for looms, and in some parts of South America, where the climate is very dry, is preferred for iron tiring wagon wheels. A recent application of it for window cords and dumb waiters manufactured by a firm in Williamsburgh, N. Y. is proving a success.